

## 4 Predictive importance—behaviour

### Introduction

The method employed in this follow-up study has been described in detail in a previous chapter. This chapter gives an account of the later behavioural development of children who, at the age of three years, were recorded as being speech retarded when compared with a matched control group (see Chapter 3).

Evidence from the literature suggests that the so-called developmental retardation syndrome may not be as benign a condition as was originally assumed. The 1000 family study (Morley, 1965) has shown that the use of incomplete sentences at the age of three years nine months rapidly improves, so that one year later very few children have this disability. Furthermore, by the age of seven years most developmental mispronunciations have disappeared spontaneously (Butler *et al.*, 1973). However, this apparent spontaneous improvement or apparent catching up does not necessarily mean that henceforth all will be well as worrying long-term consequences have been reported. The Edinburgh research group (Ingram, 1963; Mason, 1967), in their follow-up of speech retarded children when they have reached primary schools, report that the majority have reading difficulties. Rutter (1972) points out that to read and 'to understand the meaning of what he reads . . . a child must have language skills'. He accordingly argues that speech delayed children are likely to have reading delays as well because both reflect language impairment. Sheridan (1948) has commented that continuing mispronunciation indicates serious difficulties in learning. In addition, retrospective studies of school age children with serious reading difficulties frequently provide evidence of a history of speech delay (Blank *et al.*, 1968; Rutter and Yule, 1970). Such studies have mostly concerned themselves with educational sequelae, few attempting to ascertain systematically the precise behavioural consequences of, or association with, speech delay.

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We already know that different facets of behaviour are highlighted by tapping different sources of information such as parents or schools (Graham and Rutter, 1970), the children themselves (Kolvin *et al.*, 1975) or direct clinical examination by a psychologist or psychiatrist. For this reason we considered it necessary to study data from all these sources.

### Method

Information about behaviour and temperament, accordingly, was derived from the following sources:

- (a) *Parents*—using behavioural and temperamental inventories (Kolvin *et al.*, 1975; Garside *et al.*, 1975).
- (b) *Teachers*—using the Rutter 'B' Scale (1967).
- (c) *Direct evidence from the child* on a self-rating personality inventory (JEPI) read out to the child by the examiner.
- (d) *Direct examination by psychologist*.
- (e) Systematic psychiatric examination using a modified version of the scheme proposed by Rutter and Graham (1970) simultaneously with a *physical* and *neurological* examination.

The techniques used in the above assessments are so varied that they are more conveniently described as separate introductions to each subsection.

### Findings

*Dimensions of behaviour and temperament* (interview with parents). The parental interview questionnaires which were used to assess the behaviour and temperamental characteristics of these children are described elsewhere (Kolvin *et al.*, 1975; Garside *et al.*, 1975). As this evidence was obtained from parents, comparable ratings were available for the pathological speech retarded group.

#### *Temperament* (Table I)

Four main dimensions of temperament (Garside *et al.*, 1975) were studied—withdrawal, irregularity, mood and activity. There were no significant differences between the controls and the Residual Speech Retarded Group and the pathological speech retarded group on three of the four dimensions. The exception was the withdrawal dimension where the two speech retarded groups of children proved significantly

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more withdrawn than the controls ( $p < 0.01$ ). Further, the pathological speech retarded group proved significantly more withdrawn than the Residual Speech Retarded Group.

#### *Dimensions of behaviour (Table I)*

Here we studied four dimensions derived from factor analysis (Kolvin *et al.*, 1975), and also five additional dimensions which we considered clinically meaningful. The first four dimensions were summated to produce a global behaviour score.

With regard to behaviour, as assessed by the parents, there were no global differences between the groups; however, the Residual Speech Retarded Group were found to be significantly different from the controls on three of the nine dimensions—they showed more motor activity ( $p < 0.05$ ), fewer psychosomatic symptoms ( $p < 0.05$ ) and poorer appetite ( $p < 0.05$ ). The pathological speech retarded group were found to be significantly different from the controls on four of the nine dimensions—they had more neurotic symptoms ( $p < 0.01$ ), fewer sleep problems ( $p < 0.05$ ), more bowel/bladder problems ( $p < 0.01$ ) and more motor activity ( $p < 0.01$ ). It is evident that the two study groups differ in different ways from the control group. This pattern of differences, with higher mean scores than the controls on some dimensions and lower mean scores on others, is unlikely to give rise to higher global scores. The only common pattern is the greater motor activity of the two speech retarded groups. However, it is noteworthy that, in spite of the smaller size of the sample, three of the four significant differences for the pathological speech retarded group were at the 1% level.

#### *Items or variables of behaviour*

When we studied the variables (some of which were incorporated in the dimension scores) we found that most of the differences had already emerged in the study of the dimensions and therefore few of these variables merit further description. The Residual Speech Retarded Group wet their beds, told 'lies' and pilfered significantly more frequently than the controls. The pathological speech retarded group wet and pilfered significantly more frequently than the controls ( $p < 0.01$ ).

It is noteworthy that the mothers of the two speech retarded groups describe their children, at the age of seven, as having highly significant poorer enunciation than the controls. Hence, it would seem that the parents still recognize speech deficiencies in their children some three to four years after they were identified as having a speech delay.

Table 1 Behaviour, temperament and personality

Measures	a = Controls	b = Residual Speech Retarded Group	c = Pathological speech retarded group	Significance 5%	Significance 1%
<b>A. Rutter teacher scale</b>					
(i) antisocial	—	—	—	NS <sup>a</sup>	
(ii) neurotic	—	—	—	NS	
(iii) total	m 5.79	8.34	11.06	a vs b	a vs c
(iv) total score 9+	24 (24%)	30 (36.1%)	9 (54%)	a vs b	a vs c
9-	78	53	8		
<b>B. JEPI</b>					
(i) extraversion	m 18.01	16.73	NA <sup>b</sup>	a vs b	
(ii) neuroticism	—	—	NA	NS	
(iii) lie	—	—	NA	NS	
<b>C. Temperament dimensions</b>					
(i) withdrawal	m 16.8	19.31	22.33	b vs c	a vs c
(ii) irregularity	—	—	—	NS	
(iii) mood	—	—	—	NS	
(iv) activity	—	—	—	NS	
<b>D. Behaviour dimensions</b>					
(i) neurotic	m 13.35	13.74	16.00	NS	a vs c
(ii) antisocial	—	—	—	NS	
(iii) sleep	m 4.96	4.84	3.50	a vs c	
(iv) somatic	—	—	—	NS	
(v) bowel/bladder	m 3.44	4.00	5.08	a vs b	a vs c
(vi) motor activity	m 2.89	3.48	5.31	a vs b	b vs c
(vii) psychosomatic	m 8.24	7.44	7.73	NS	
(viii) phobias	—	—	—	NS	
(ix) appetite	m 3.68	3.04	3.53	a vs b	
total	—	—	—	NS	

For the sake of simplicity standard deviations have not been included—available on request from I.K. The data has been omitted when there are no significant differences. <sup>a</sup> NS = not significant <sup>b</sup> NA = data not available

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*Behaviour questionnaire completed by teachers (Table I)*

The Rutter 'B' Scale has been fully described elsewhere (Rutter, 1967; Rutter *et al.*, 1970a). There are three main scores—total score and two subscales—neurotic and antisocial. On evidence from the teacher, both the Residual Speech Retarded Group and the pathological speech retarded group had significantly higher (adverse) total behaviour scores than the controls (Table I). There were no differences on the neurotic or antisocial subscores.

*Personality assessment (Table I)*

We used the Junior Eysenck Personality Inventory (Eysenck, 1965) which has three scales—neuroticism, extraversion and lie. Again, this is extensively described elsewhere.

On this self report inventory the Residual Speech Retarded Group proved more introverted than the controls. This is in accord with the withdrawal described by the parents as reported above. (It was decided to use the method whereby the examiner read each question to the child and recorded the response so as to minimize any difficulties the child might have in reading the inventory.)

*Clinical assessment by psychologist*

The psychologist (Tables 9 and 10, Appendix 1) rated the children's behaviour during assessment on three three-point rating scales—attention span, level of confidence and presence of psychiatric disorder. The Residual Speech Retarded Group displayed a poorer level of confidence ( $p < 0.01$ ) and a poorer level of attention span ( $p < 0.01$ ) as compared to the controls. However, it did not prove possible to assess a sufficient percentage of the pathological deviants to make statistical analysis a valid exercise. Finally, the speech groups were rated as more psychiatrically disturbed than the controls ( $p < 0.01$ ) and the pathologically speech retarded group as even more disturbed than the Residual Speech Retarded Group. The rating was conducted blind as apart from the children in the pathological deviant group the membership of the remaining children was not known.

*Psychiatric, physical and neurological examination*

In this section we concern ourselves with direct examination of the child by a medical member of the team. The assessments comprised:

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- (a) A standardized psychiatric interview (Kolvin *et al.*, 1976; Wrate *et al.*, 1976; Rutter, 1967). At the end of this interview the children were rated as to whether they had 'No psychiatric disorder', 'Dubious' or 'Moderate' or 'Marked disorder'.
- (b) A clinical neurological examination which is described elsewhere (Atkins *et al.* 1976) based on ratings of a series of what can be considered 'hard signs' on a three-point scale.
- (c) The weight and height of the children.

Owing to shortage of resources it did not prove possible to study every child. We therefore planned a blind examination of a random sample and of approximately three-quarters of the speech retarded and control groups. The pathological speech retarded group was excluded from those examinations where it was felt it would not be appropriate or possible to carry them out in a standardized fashion. Further, the psychiatric examination of the children in the pathological speech retarded group was not conducted blind because at interviews it was usually strikingly obvious which children fell into this category as they were so qualitatively different from the others. Thus the examination of the pathological speech retarded group was of the usual clinical kind. However, the examination of the control group and the Residual Speech Retarded Group was blind—both in the sense of the interviewer not knowing from which group the child was drawn and in not having available the background information described above.

No significant differences in stature were found between the control group and the Residual Speech Retarded Group; on neurological examination the differences between the two groups were slight, although for each measure the more abnormal score was obtained by the speech group. However, our findings from the psychiatric interview clearly demonstrated a tendency for the speech group to obtain more abnormal scores on all of the measures examined; these measures include dimensions of sociability, liking of school, motor activity, *rapport* or 'accessibility' and amount of spontaneous speech. In the last three measures the differences reach statistical significance; children in the speech retarded group have less spontaneous speech at interview ( $p < 0.02$ ), *rapport* is more difficult to establish, that is, they are more inaccessible ( $p < 0.01$ ), and a greater number have increased motor activity ( $p < 0.01$ ).

If the presence of mental handicap or moderate/marked mental disorder (of any type) are both included as constituting a definite psychiatric handicap then the rate of moderate or serious handicap in the total speech retarded group assessed is more than double that of the controls. These findings validate the other assessments in this section in confirming that speech delay at three has considerable predictive

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### **Relationship between behaviour, intelligence and language development**

It has been pointed out (Lewis, 1963, 1968; Rutter, 1972) that both 'cognition' and 'socialization' have a close association with language. For instance, social anxiety and shyness are common in children with delayed or deviant language. This is particularly true, for instance, of autism and elective mutism. Further, Chess and Rosenberg (1974) report that one in four of the referrals to a psychiatric clinic had speech or language delay and of those with such delays three out of four had associated behaviour problems. Previously Leontiev and Leontiev (1959) on theoretical grounds predicted such an association, based on the fact that social interactions, which comprise one aspect of the child's behaviour, usually involve the use of language for communication and expressive purposes. A question which must then be posed is, what is the precise relationship between intelligence, language and deviant behaviour?

We studied the association between language and behaviour by correlational analysis and our findings confirm the association with a significant but not high correlation of 0.35 ( $p < 0.01$ ) between language and deviant behaviour (see Table 11, Appendix 1).

While it is well known that behaviour difficulties are associated with poor IQ and poor educational achievements (Yule and Rutter, 1970b) there remain crucial questions of what constitutes cause and effect. Our research was not designed to answer such questions but the fact that our Residual Speech Retarded Group's primary disorder was speech, strongly suggests that a disorder of speech and language precedes behavioural deviance. Demonstration of a high and significant relationship (Vernon, 1961, 1964) between language and intelligence in a group of children with speech and language delay supports the theory that most of the demonstrated associated deviant behaviour is secondary to cognitive and language problems. The high positive correlation which we found between the language and intelligence scores of both the Residual Speech Retarded Group ( $r = 0.83, p < 0.01$ ) and the controls ( $r = 0.74, p = < 0.01$ ), is compatible with such a theory. Moreover, both language and intelligence scores of the Residual Speech Retarded Group proved to be below average, in contrast to the average scores of the controls. However, like Mittler (1972) we are not asserting that there should always be a close relationship between language development on the one hand and

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intellectual development on the other. For instance, the relationship between language and intellectual development is particularly complex in certain subgroups, such as deaf children (Furth, 1971) and dysphasic children (Olson, 1961; Bartak *et al.*, 1975) and, as is shown elsewhere in this monograph, with our 'specific' speech delayed group.

### **Behaviour and general milestone delay and specific milestone delay**

A further way of considering themes described above is by dividing the speech retarded group into those with speech delay alone (specific speech delayed group) as compared to those with delay of both speech and walking (general delayed group). On evidence from the teacher (Rutter 'B' Scale) the general delayed group displayed significantly poorer behaviour than the controls as reflected by their total scores (see Table II). While the specific speech delayed group also showed poorer behavioural adjustment, the differences were not significant. Furthermore, there were no significant differences on either the antisocial or neurotic subscales of this questionnaire.

On the Junior Eysenck Personality Inventory (a self rating questionnaire where, the tester read each question to the child so as to minimize any difficulties the child might have in reading) the intermediate and general delayed groups respectively proved significantly more introverted than the controls. Though the specific speech delayed group was also more introverted than the controls, the difference fell short of statistical significance ( $p < 0.1$ ). There were no significant differences between the groups on the dimension of neuroticism and the lie scale.

### **Relationship between verbal ability and behaviour**

The next question to be asked is whether poor verbal ability is associated with deviant behaviour irrespective of whether the child has a speech disorder. It was considered that a more valid answer would be obtained if we confined ourselves to a study of data from the control group. We, therefore, correlated the EPVT (English Picture Vocabulary Test) scores with 11 measures of behaviour and temperament, and found that six of these 11 measures had correlations of above 0.2 (Rutter teacher total score—0.23; irregularity of temperament—0.22; mood—0.20; neurotic dimensions—0.21; motor activity—0.20; bowel/bladder problems—0.24). Such correlations vary slightly from verbal scale to verbal scale but the highest inverse correlation was between the language quotient and the Rutter teacher total score (Table 11 Appendix 1).



Table II Behaviour data for controls and speech retarded subgroups

Measures	Groups				Significance	
	a = Controls	b = SSD	c = IG	d = GD	5%	1%
Rutter teacher total score	m 5.8	7.3	7.3	10.2		a vs d
Eysenck JEPi extraversion	m 18.0	16.9	16.6	16.3	a vs c	a vs d

SSD = Specific speech delayed group; IG = Intermediate delayed group; GD = General delayed group.

### Discussion

There is evidence from the literature that children with speech defects are prone to psychological difficulties. Solomon (1961) describes, on the basis of evidence from mothers, tenseness, anxiety and difficulties in interpersonal relationships. Sheridan (1973) using the Bristol Social Adjustment Guide (Stott, 1958) reports that the maladjustment rate is nearly four times that found in normal children. Rutter *et al.* (1970) approached the problem from a starting point of psychiatric disorder, and reported that boys with psychiatric disorder had double the number of speech disorders that occurred in the general population. Others assert (Rutter, 1972; Lewis, 1963, 1968) that social anxiety and shyness are common in children with language delay 'regardless of its cause' (Rutter, 1972). Ingram (1959b), in his study of children with developmental speech disorders, reported that 10 out of 80 were undergoing psychiatric treatment. He describes solitariness, withdrawal, dependency and immaturity and inappropriate reaction to frustration (tantrums or tears). Myklebust (1954) has reported similarly on children with speech disorders. However, it has been pointed out (Rutter, 1971) that the sequelae of different types of language handicaps should be studied separately and comparatively, and such studies are few (Goodstein, 1958; Lewis, 1968). Even fewer are studies of the long-term effects of earlier speech and language difficulties on behaviour. Our study provided just such an opportunity as we were able to compare groups of children with different types of speech retardation with a control group.

On the behaviour scales completed by the teachers the two groups of speech retarded children were found to be significantly more disturbed. Such disturbance bears an inverse relationship to the children's intellectual and language performance irrespective of whether the children fall into the control or the study groups. Two possible explanations spring to mind—the first is that intellectual dullness is validly related to maladjustment. Alternatively, we are witnessing the 'halo-effect' of children with comparatively poorer intellectual and language potential perceived by the teacher as showing significant excesses of disturbed behaviour.

The Residual Speech Retarded Group shows evidence of introversion and withdrawal as compared to the control group. This conclusion has support from the data derived from interview with parents in this study, the lower extraversion scores on the JEPI, poorer levels of self-confidence as perceived by the psychologist and also previous reports of withdrawal reported in the literature (Ingram, 1959a; Solomon, 1961). What we do have is evidence that multiple delays of major milestones in the earlier years of life are significantly associated with later behaviour problems. In previous chapters we have shown that the group with

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multiple delays have significantly poorer IQs than the controls. Hence a possible explanation for the excess of behavioural problems is that they are determined by poorer intelligence of the study groups. This suggests that the behaviour problems are, in part at least, secondary to cognitive, speech and language problems.

### Summary

The weight of evidence that we have set out above provides incontrovertible proof of long-term behavioural sequelae of speech disorders in the early years of life. Those speech disorders which are more clearly pathological have by far the severest consequences. The most clear-cut pattern identified is that of speech delay and later introversion and withdrawal. When reports from teachers and the results of psychiatric assessment are considered in terms of global scores then such measures always differentiate the controls from the study groups. However, when information is obtained from parents or children then such measures do not consistently differentiate the groups.

Finally, there is evidence that severity of disturbance correlates inversely with performance on tests of intelligence and language irrespective of whether the child belongs to a study group or the control group.